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an integer from 0 to 5 with the proviso that at least one X is fluorine, and wherein Y is hydrogen or halogen and at least one Y is hydrogen and at least one Y is fluorine.

34. The method of claim 33 wherein the layer of silicon oxide contains at least about 2.5 atomic percent of fluorine over the conductive lines.

REMARKS

Claims 1-10, 27- 29, and 31-34 are pending. Claims 27 and 33 have been amended to correct informalities. No new matter has been introduced.

Claims 1-10, 27-29, and 31-34 stand rejected as being based on a defective declaration under 35 U.S.C. § 251. Any defect of the declaration will be corrected by submitting a supplemental declaration at a later date.

Claims 27-29 and 31-34 stand rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicants regard as their invention. Claims 27 and 33 have been amended to correct informalities. More particularly, claim 27 has been amended to recite "forming the layer with the desired tensile stress from the plasma enhanced reaction of the selected process gas and the flow of the halogen source at the flow rate." Claim 33 has been amended to recite "a mixture of the tetraethylorthosilicate and . . . ." Applicants believe the claims comply with 35 U.S.C. § 112.

Claims 27-29 and 31-33 stand rejected under 35 U.S.C. § 251 as being an improper recapture of subject matter surrendered in the application for the patent upon which the present reissue is based.

Applicants note that the addition of claims 27-29 and 31-34 does not violate the recapture rule. MPEP 1412.02 states:

> Impermissible recapture occurs in a reissue where the claims in the reissue are of the same scope as, or are broader in scope than, claims deliberately canceled in an application to obtain a patent. Where such claims also include some narrowing limitation not present in the claims deliberately canceled in the application, the examiner must determine whether that narrowing limitation has a material aspect to it. If the narrowing limitation has a material aspect to it, then there is no recapture.

In this case, Applicants respectfully assert that independent claim 27 includes a narrowing limitation not present in the claims deliberately canceled in the application and that the narrowing limitation has a material aspect to it. The narrowing limitation in claim 27 is as follows:

> adding a flow of a halogen source to the selected process gas at a flow rate previously determined to achieve a desired stress in the layer from a plasma enhanced reaction of the selected process gas and the flow of the halogen source at the flow rate, the desired stress in the layer being a tensile stress instead of a compressive stress in another layer formed from another plasma enhanced reaction of the selected process gas without the flow of the halogen source; and
>
> forming the layer from the plasma enhanced reaction of the selected process gas and the flow of the halogen source at the flow rate.

The Examiner alleges that there is recapture because the recited stress and the concentration of fluorine are inherently related. MPEP 1412.02 states that "if the narrowing limitation is incidental, mere verbiage, or would be inherent even if not recited (in view of the specification), then the claims should be rejected under 35 U.S.C. 251." In this case, even assuming *arguendo* that the change of the stress in the layer were inherently related to the fluorine concentration, the formation of a layer at the flow rate selected to produce a tensile stress instead of a compressive stress in the layer would still not be incidental, mere verbiage, or inherent. Rather, the formation of a layer having a tensile stress by selecting an appropriate flow rate of the halogen source has a material aspect to it that was not previously surrendered or deliberately canceled and was not inherent in the previously examined claims.

The Examiner's rejection appears to be predicated on her belief that the arguments concerning the various stresses are not supported by the specification and do not make sense. As stated in the Declaration of Musaka, ¶ 6, however, Fig. 13 of the present Patent Application shows a reduction of the stress, which is a compressive stress of about $-1.25X10^9$ dyne/cm^2 at zero C_2F_6 flow, with higher C_2F_6 flow rates, where the stress changes from negative (i.e., compressive) to positive (i.e., tensile) at about 450 sccm C_2F_6 flow rate. The Examiner's belief has no basis.

Therefore, Applicants respectfully submit there is no recapture of subject matter surrendered in the application for the patent upon which the present reissue is based.

Claims 27-29 and 31-34 stand rejected under 35 U.S.C. § 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventors, at the time the application was filed, had possession of the claimed invention. The Examiner alleges that claims 27-29 and 31-34 contain new matter. Claims 27-29 and 31-33 stand rejected under 35 U.S.C. § 251 as being based upon new matter added to the patent for which reissue is sought. The Examiner alleges that the use of the term "tensile" stress in claim 27 introduces new matter because the specification only uses the terms "intrinsic" stress and "compressive" stress.

Applicants respectfully submit that the disclosure of the present application clearly teaches the addition of a flow of a halogen source to a selected process gas at a flow rate to achieve a desired tensile stress in the layer from a plasma enhanced reaction of the selected process gas and the flow of the halogen source at the flow rate instead of a compressive stress in another layer formed from another plasma enhanced reaction of the selected process gas without the flow of the halogen source. The specification discusses the presence of compressive stress in the film. At page 14, lines 28-30, the specification states that Fig. 13 shows a reduction of the stress, which is a compressive stress of about $-1.25X10^9$ dyne/cm^2 at zero C_2F_6 flow, with higher C_2F_6 flow rates. As shown in Fig. 13, the stress changes from negative (i.e., compressive) to positive (i.e., tensile) at about 450 sccm C_2F_6 flow rate. See Declaration of Musaka, at ¶ 6.

It has been long held that "*ipsis verbis* disclosure is not necessary to satisfy the written description requirement of section 112. Instead, the disclosure need only reasonably convey to persons skilled in the art that the inventor had possession of the subject matter in question." *Fujikawa v. Wattanasin*, 39 U.S.P.Q.2d 1895, 1904 (Fed. Cir. 1996) (citation omitted); *In re Alton*, 37 U.S.P.Q.2d 1578, 1584 (Fed. Cir. 1996) ("If a person of ordinary skill in the art would have understood the inventor to have been in possession of the claimed invention at the time of filing, even if every nuance of the claims is not explicitly described in the specification, then the adequate written description requirement is met."). The disclosure of the tensile stress is clear to a person of ordinary skill in the art. Disclosure of the tensile

stress in the form of Fig. 13 is adequate. "To meet the requirement of § 112, the patent application need not utilize any particular form of disclosure." *Emory Univ. v. Glaxo Wellcome Inc.*, 44 U.S.P.Q.2d 1407, 1412 (N.D. Ga. 1997). Thus, the claims comply with 35 U.S.C. § 112. Because the change of the stress from compressive to tensile by introducing adequate flow of halogen source is clearly disclosed, the claims do not introduce new matter.

The disclosure is objected to based on alleged informalities directed to the negative stress values in Fig. 13 which the Examiner believes to be scientifically incorrect. In Fig. 13, the stress in the layer is a compressive stress of about $-1.25X10^9$ dyne/cm^2 at zero C_2F_6 flow rate. The magnitude of the compressive stress decreases with an increase in the C_2F_6 flow rate. At a C_2F_6 flow rate of about 600 sccm, the stress becomes a tensile stress of about $0.4X10^9$ dyne/cm^2. Declaration of Musaka, at ¶ 6. The Examiner alleges that the values should not be negative, but just down an order of magnitude. The Examiner apparently confuses a regular scale which is used in Fig. 13 with a logarithmic scale which would be used to represent changes in orders of magnitude. There is nothing scientifically incorrect about a change in the stress from compressive to tensile going through a zero stress state as the process conditions are altered, such as the change in the gas flow rate shown in Fig. 13. The Examiner's objections have no basis.

Claims 1-10 stand provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 29-33, 38-40, and 42-45 of copending Application No. 08/888,499. Applicants intend to file a terminal disclaimer in response to this rejection.

Claims 27, 28, and 31 stand rejected under 35 U.S.C. § 102(b) or (e) as anticipated by or, in the alternative, under 35 U.S.C. § 103(a) as obvious over Homma (USP 5,288,518). The Examiner alleges that Homma teaches the formation of fluorine-containing silicon oxide films where the internal stress is $2X10^8$ dynes/cm^2.

Applicants respectfully assert that claims 27, 28, and 31 are novel and patentable over Homma because, for instance, Homma does not disclose or suggest adding a flow of a halogen source to the selected process gas at a flow rate previously determined to achieve a desired stress in the layer which is a tensile stress instead of a compressive stress in

another layer formed without the flow of the halogen source, as recited in claim 27 from which claims 28 and 31 depend. There is nothing in Homma that suggests the recited features.

The Examiner's rejection appears to be predicated on her belief that the arguments concerning the tensile stress do not make sense. As stated in the Declaration of Musaka, ¶ 6, however, Fig. 13 of the present Patent Application shows a reduction of the stress, which is a compressive stress of about $-1.25X10^9$ dyne/cm^2 at zero C_2F_6 flow, with higher C_2F_6 flow rates, where the stress changes from negative (i.e., compressive) to positive (i.e., tensile) at about 450 sccm C_2F_6 flow rate. Accordingly, clams 27, 28, and 31 are novel and patentable.

Claims 1-10, 27-29, and 31-34 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Nishiyama et al. The Examiner recognizes that Nishiyama et al. does not disclose the fluorine-containing halocarbon gases recited in claim 1, but alleges that it would have been obvious to substitute the claimed fluorocarbon compounds for the CF_4 disclosed in Nishiyama et al.

Applicants respectfully submit that claims 1-10 are patentable over Nishiyama et al. because, for instance, Nishiyama et al. does not teach or suggest forming a layer using a gas comprising tetraethylorthosilicate and a gas selected from the group consisting of CY_4 and CX_3-$(CX_2)_n$-CX_3, wherein X is hydrogen or halogen and n is an integer from 0 to 5 with the proviso that at least one X is fluorine, and wherein Y is hydrogen or halogen and at least one Y is hydrogen and at least one Y is fluorine. Nishiyama et al. discloses only CF_4 and is devoid of any suggestion for the recited compounds.

Applicants further contend that claims 27-29 and 31-34 are patentable over Nishiyama et al. because, for instance, Nishiyama et al. does not disclose or suggest adding a flow of a halogen source to the selected process gas at a flow rate previously determined to achieve a desired stress in the layer which is a tensile stress instead of a compressive stress in another layer formed without the flow of the halogen source, as recited in claim 27 from which claims 28, 29, and 31-34 depend. There is nothing in Nishiyama et al. that suggests the recited features.

The Examiner's rejection appears to be predicated on her belief that the arguments concerning the tensile stress do not make sense. As stated in the Declaration of

Musaka, ¶ 6, however, Fig. 13 of the present Patent Application shows a reduction of the stress, which is a compressive stress of about $-1.25X10^9$ dyne/cm^2 at zero C_2F_6 flow, with higher C_2F_6 flow rates, where the stress changes from negative (i.e., compressive) to positive (i.e., tensile) at about 450 sccm C_2F_6 flow rate. Accordingly, clams 1-10, 27-29, and 31-34 are novel and patentable.

Claims 27-29 and 31-34 stand provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 29-33, 38-40, and 42-45 of copending Application No. 08/888,499. Applicants intend to file a terminal disclaimer in response to this rejection.

Claims 27-29 and 31-34 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over WO 92/20888 to Weise. Applicants respectfully assert that claims 27-29 and 31-34 are patentable over Weise because, for instance, Weise does not disclose or suggest adding a flow of a halogen source to the selected process gas at a flow rate previously determined to achieve a desired stress in the layer which is a tensile stress instead of a compressive stress in another layer formed without the flow of the halogen source, as recited in claim 27 from which claims 28, 29, and 31-34 depend. There is nothing in Weise that suggests the recited features.

Generating a tensile stress instead of a compressive stress in a layer by adding a flow of a halogen source is illustrated, for instance, in Fig. 13. In Fig. 13, the halogen source is C_2F_6. The stress in the layer is a compressive stress of about $-1.25X10^9$ dyne/cm^2 at zero C_2F_6 flow rate. The magnitude of the compressive stress decreases with an increase in the C_2F_6 flow rate. At a C_2F_6 flow rate of about 600 sccm, the stress becomes a tensile stress of about $0.4X10^9$ dyne/cm^2. Nothing in the cited art discloses or suggests adding a flow of a halogen source to a selected process gas comprising tetraethylorthosilicate and oxygen to achieve a tensile stress, instead of a compressive stress in another layer formed using the selected process gas without the flow of the halogen source.

The Examiner's rejection appears to be predicated on her belief that the arguments concerning the tensile stress do not make sense. As stated in the Declaration of Musaka, ¶ 6, however, Fig. 13 of the present Patent Application shows a reduction of the stress, which is a compressive stress of about $-1.25X10^9$ dyne/cm^2 at zero C_2F_6 flow, with

higher C_2F_6 flow rates, where the stress changes from negative (i.e., compressive) to positive (i.e., tensile) at about 450 sccm C_2F_6 flow rate. Therefore, claims 27-29 and 31-34 are patentable.

CONCLUSION

In view of the foregoing, Applicants believe all claims now pending in this Application are in condition for allowance. The issuance of a formal Notice of Allowance at an early date is respectfully requested.

If the Examiner believes a telephone conference would expedite prosecution of this application, please telephone the undersigned at 650-326-2400.

Respectfully submitted,

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